

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-34. (Cancelled)

35. (Currently Amended) A piano hinge defining a hinge line, the piano hinge comprising a two-way shape memory alloy (SMA) positioned along the hinge line to form a pin that at least partially twists when the two-way SMA pin changes between an austenite temperature and a martensite temperature, first and second hinge leafs defining a passage into which the two-way SMA pin fits, and a key-spline arrangement rigidly securing each respective end portion of the two-way SMA pin to the first and second hinge leafs respectively to provide for transfer of torque in both clockwise and counterclockwise directions from the two-way SMA pin to one of the hinge leafs relative to the other of said hinge leafs, whereby the piano hinge does not freely pivot but pivots in response to the two-way SMA pin twisting as the temperature of the two-way SMA pin changes between the austenite temperature to the martensite temperature.

36. (Previously Presented) The piano hinge of claim 35, wherein the hinge leafs include alignable knuckles that define the passage into which the two-way SMA pin fits.

37. (Previously Presented) The piano hinge of claim 35, wherein the two-way SMA is configured to apply torque within a range of about 27 inch pounds and about 1740 inch pounds.

38. (Previously Presented) The piano hinge of claim 35, wherein the two-way SMA is configured to apply torque within a range of about 27 inch pounds and about 1010 inch pounds.

39. (Previously Presented) The piano hinge of claim 35, wherein the two-way SMA is configured to apply torque within a range of about 1010 inch pounds and 1740 inch pounds.

40. (Previously Presented) The piano hinge of claim 35, wherein the two-way SMA is configured to apply torque at about 1740 inch pounds.

41. (Currently Amended) A piano hinge comprising first and second hinge leafs having alignable knuckles that define a passage into which a hinge pin fits, a two-way shape memory alloy (SMA) hinge pin at least partially disposed within the passage defined by the knuckles, the two-way SMA hinge pin being made of a NiTiNol alloy and having at least a first tab at one end portion of the two-way SMA hinge pin rigidly secured to the first hinge leaf and at least a second tab at an opposite end portion of the two-way SMA hinge pin rigidly secured to the second hinge leaf such that the piano hinge does not freely pivot, wherein the two-way SMA hinge pin at least partially twists when the two-way SMA hinge pin changes between an austenite temperature and a martensite temperature of the NiTiNol alloy, such that torque generated by ~~from~~ the two-way SMA hinge pin in either a clockwise or counterclockwise direction is transferred to one of the hinge leafs relative to the other of said hinge leafs, whereby the piano hinge pivots in response to the two-way SMA hinge pin twisting as the temperature of the two-way SMA hinge pin changes between the austenite temperature and the martensite temperature.

42. (Previously Presented) The piano hinge of claim 41, wherein the first tab is at one end portion of the two-way SMA hinge pin and the second tab is at the other end portion of the two-way SMA hinge pin, such that the partial twisting of the hinge pin applies a torque to the first tab relative to the second tab.

43. (Previously Presented) The piano hinge of claim 42, wherein the hinge pin rotates into an intermediate partially twisted configuration when a temperature of the two-way SMA is between the austenite temperature and the martensite temperature.

44. (Previously Presented) The piano hinge of claim 43, wherein the two-way SMA is configured to apply torque within a range of about 27 inch pounds and about 1740 inch pounds.

45. (Previously Presented) The hinge apparatus of claim 43, further comprising a device to cause the hinge pin to heat and switch the two-way SMA between at a first trained shape and a second trained shape.